

On the Occurrence of the Norwegian *Argentina silus** on the Shore of the Moray Firth, Banffshire. By THOMAS EDWARD, A.L.S.

[Read April 21, 1881.]

THE present being one among the few instances of the capture of this species in the British seas, the writer presumes that a notice of the fact, with an account of the fish itself, may not be uninteresting to the members of the Linnean Society.

The fish alluded to was taken about the end of October, 1879, nearly thirteen miles west from the town of Banff, and was sent to me for examination, as none of the fishermen had seen one of the same kind before. It was also new to me. With the aid of two friends, Professors Trail and Ewart, of Aberdeen University, I was enabled definitely to identify it as here named in the title of the paper, though previously to this Dr. Günther had hinted by letter that it might be *Argentina silus*.

Description of the Fish.—Length $8\frac{1}{4}$ inches. Height of body near shoulders (where the fish is deepest) about 1 inch. Circumference at same place over 2 inches, near the tail scarcely 1. Length of head $1\frac{3}{4}$ inch, which tapers considerably towards the mouth, which is very small and gives the head a most remarkable appearance. Breadth behind the eye 1 inch. Length of tail (which is deeply forked) $1\frac{1}{2}$ inch. Dorsal fin in front nearly $1\frac{1}{2}$ inch in height and pointed, the first ray being the longest, the others shortening as they go backwards. Adipose fin about $\frac{1}{2}$ inch in height, is rather boomerang-shaped, and placed only $\frac{1}{2}$ inch from the root of the caudal, its insertion being in direct line with the centre of the anal. Pectorals rather pointed and over 1 inch in length. Ventrals nearly an inch, and broadish at their tips. Anal fin at its commencement $\frac{3}{4}$ of an inch, but lessens towards its extremity, which is within $\frac{1}{2}$ inch of the tail. The dorsal fin

* When this paper was written and forwarded to the Society I was under the impression that the species had not hitherto been obtained on the British coasts. My isolated position did not enable me to consult books or museums, and a copy of the Society's Journal containing Dr. Francis Day's paper "On the Hebridal Argentine" (Journ. Linn. Soc. vol. xv. p. 78, pl. iv.), not having then reached me, I was unaware of the most recent notice of the fish in question, and of its determination with the *Argentina sphyraena*, Linn. I would gladly have withdrawn my paper on learning of Dr. Day's; but the Council of the Society have thought fit to print it, as an additional record of a fish whereof only three British specimens have previously been taken.

commences about $1\frac{1}{2}$ inch from the head ; ventrals nearly opposite where the dorsal ends ; pectorals close to the gill-covers. The fin-rays, so far as I could make them out, are as follows :—D. 9, P. 13, V. 14, A. 11 to 12, C. 24.

I may mention, however, that the fins were somewhat hardened and contracted, the fish having been dead some days before it reached me.

The most important and peculiar characteristic of the fish is the shape of its body. In this respect it is decidedly in part hexagonal and in another heptangular. Thus in a great measure its small contracted mouth resembles the Syngnathidæ, or pipe-fishes ; but at the same time it differs widely in every other respect. In the adipose appendage and the disposition of its fins it approaches the Salmonidæ ; but here again it differs as materially, if not more so, from this tribe in the form of its body.

Another special and interesting peculiarity, which is not found in either of the families alluded to, although met with in the keel of the Clupeidæ, is that each division of the body is distinctly separated by a visible ridge, which, in most cases, are minutely but very sharply serrated. These serrations may be felt by passing the finger downwards from the head. The sensation and peculiar irritation, though not an unpleasant one, resembles that given to the hand when rubbed gently along a very finely cut saw. This is particularly the case with the parts at the centre of the belly, which latter, like the back, is distinctly divided by a raised ridge or keel ; the serrations here seem to be stronger and larger than on the other ridges.

The back is nearly $\frac{3}{4}$ of an inch broad, the first compartment about $\frac{1}{4}$ inch, the other a little more and bounded by the lateral line, which is straight. The stripe immediately below it is the broadest of all, being $1\frac{1}{2}$ inch, the others get narrower as they descend. Belly not quite so broad as the back.

As the number of divisions so are the number of colours, each being mostly of a different hue. That on the back would seem to have been of a deep amber tint, the next, sidewise, being greenish blue, the other silvery grey, the one below the lateral line being of a pure silvery white, with a bright metallic lustre, the others only a little fainter, but very similar to those above ; belly greyish white, with a tinge of greenish blue and purple. The head on the top had been nearly the same as the back, with

the sides silvery. The large eye has a very bright silvery iris and a bluish-black pupil.

Another very noticeable feature of the fish was (and this took the attention and excited the admiration of others as well as myself) that, turn it whichever way you like, the glistening of the various stripes had a most beautiful and pleasing effect, exhibiting all the colours of the rainbow, the harmonious iridescence being visible whether looked at from before backwards or the reverse; when alive, doubtless, it may even have been more brilliant.

One more peculiarity of the fish, and a most striking one, is that, though about an inch in thickness, the flesh is so transparent that you can see the vertebræ quite distinctly by holding it up to the light.

From what has already been stated concerning the mouth, no one will wonder when they are told that I could only make out the gape to be $\frac{1}{4}$ of an inch.

On looking into the minute oral aperture, I could see that the upper jaw was thickly beset with numerous small teeth, but could discover none on the lower jaw. The tongue was almost covered with two large strong teeth, one on each side, and curved backwards; betwixt these there were others of a like form, but much smaller.

I may here further mention that there is a small fleshy protuberance or wart at the tip on the underside of the lower jaw.

On dissection the specimen proved to be a male, but as to its probable maturity I venture to offer no opinion. The milt, which was of a chalky whiteness and $1\frac{1}{4}$ inch in length, did not seem to me to be full; it might have been partly spent.

The stomach contained the remains of a few of the smaller crustaceans, such as *Darwinia compressa* and *Proto pedata*, &c., also fragments of *Sertularia filicula* and *Antennularia antennaria*, &c. This may show, or at least give, an indication that its habitat is amongst the corallines, and that its small pointed-like mouth is well adapted for picking off the minute zoophytes from their horny stems. Its form, too, is such as to enable it to glide with perfect ease, and its large eyes to see its way through amongst the countless animal forests which everywhere clothe that part of the ocean where it seems to live and sport.
